

From wd5ivd@tapr.org Sat Mar 02 01:45:23 1996  
Received: (from wd5ivd@localhost) by tapr.org (8.7.4/8.7.3/1.8) id BAA15862 for  
tapr-bb@tapr.org; Sat, 2 Mar 1996 01:45:22 -0600 (CST)  
From: Greg Jones <wd5ivd@tapr.org>  
Message-Id: <199603020745.BAA15862@tapr.org>  
Subject: TAPR files its comments on RM-8737  
To: tapr-bb@tapr.org (TAPR-BB mailing)  
Date: Sat, 2 Mar 1996 01:45:22 -0600 (CST)  
X-Mailer: ELM [version 2.4 PL25]  
Content-Type: text

TAPR files its comments on RM-8737.

If you would like to read the initial filing as well as other comments, they  
are available on <http://www.tapr.org/ss> TAPR will be keeping the Amateur  
Spread Spectrum page as accurate as possible during the FCC process.

In addition, the Spread Spectrum Special Interest group has had some very  
interesting discussion regarding current technology, so feel free to join  
them by subscribing to the list. Joining can be done from the SIG web page  
on [www.tapr.org](http://www.tapr.org) -- or send e-mail to [listserv@tapr.org](mailto:listserv@tapr.org) and in the message  
body state 'subscribe ss YourName Call'.

TAPR will continue to be active on this rule making in the coming months.

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Before the

FEDERAL COMMUNICATIONS COMMISSION  
Washington, D.C. 20554

In the Matter of	)	
	)	
Amendment of Part 97 of the	)	RM-8737
Commission's Rules Governing	)	
the Amateur Radio Service to	)	
Facilitate Spread Spectrum	)	
Communications	)	

To: The Commission

COMMENTS OF TUCSON AMATEUR PACKET RADIO CORPORATION

Corporation

Tucson Amateur Packet Radio

8987-309 E Tanque Verde Rd #337  
Tucson, Arizona 85749-9399  
(817) 383-0000

February 26, 1996

The Tucson Amateur Packet Radio Corporation ("TAPR") submits these comments in response to the above-referenced petition for rule making (the "Petition") filed by the American Radio Relay League, Incorporated ("ARRL").

#### BACKGROUND AND STATEMENT OF INTEREST

TAPR is a non-profit (501(c)(3)) scientific and educational organization with more than 2,500 members worldwide. It is chartered to engage in three principal activities: scientific testing and research into the development and improvement of technological systems for use in the amateur radio service including, but not limited to, digital packet radio communications; research and testing of systems, hardware, and software for packet radio local area networks and computer network systems; and disseminating to the public the information obtained as a result of such research and testing.

TAPR was founded in 1982 as a national organization with interests in the areas of packet and digital communications. It grew out of a 1981 effort to design a packet radio Terminal Node Controller, or "TNC," that would be available to amateurs at a modest cost. From these initial designs emerged what is now the de facto standard in amateur and many commercial packet radio operations.

Today, TAPR continues as an international, membership-supported research and development organization for the amateur radio community. TAPR continues to develop new communications technology, provide kits for the amateur community, and promote the advancement of the amateur art through publications, meetings, and communications standards. TAPR also maintains a web site (<http://www.tapr.org>), which includes a page specifically addressing current amateur spread spectrum issues (<http://www.tapr.org/ss>).

#### DISCUSSION

TAPR generally supports the recommendations made by the ARRL in its Petition. Spread Spectrum ("SS") technology has not made great advances in the amateur radio service since it was first permitted in 1985, in part due to the fact that, by today's standards, the Part 97 regulations on amateur spread spectrum are extremely restrictive. In particular, the small number of fixed spreading codes permitted under Section 97.311(d)(1) inhibits the use and development of SS by amateur radio stations. TAPR believes that it is in the public interest, and in the interest of the amateur radio service, to change the rules for SS in order to accelerate the adoption of SS by the general amateur community.

TAPR also supports many of the specific recommendations made by the ARRL. First, TAPR supports the ARRL's request to modify Part 97.311(b) as it pertains to the unintentional triggering of repeater inputs. This section is

redundant with other parts of the Commission's rules and, therefore, is unnecessary.

Second, TAPR supports the ARRL's request to delete sections 97.311(c) and (d), in order to permit SS emissions and spreading codes that are not currently authorized. Elimination of the rule that dictates specific spreading codes is necessary to facilitate further experimentation and to match the provisions allowed under an existing amateur service SS STA, discussed below. In addition, it would facilitate the use and adoption by amateur radio operators of Part 15 SS equipment and hardware.

Third, TAPR supports the ARRL's proposed change to 97.311(g), which would provide for automatic transmitter power control to limit the output power of an SS station to that which is required for communication, when more than one watt of output power is used. TAPR, however, differs with the ARRL as to just how simple this requirement would be to implement technically. While TAPR agrees that technically it is simple to control the output power of a transmitter, it is quite another matter to make this control automatic and foolproof. If the Commission decides to proceed with this particular change to the rules, it should phase the change in over some reasonable period of time, in order to give the amateur community the opportunity to develop and deploy SS equipment that properly can meet this requirement.

While, as noted above, TAPR agrees with many of the ARRL's recommendations, it disagrees with a few of the proposals contained in the Petition.

In particular, TAPR differs with the ARRL with respect to the question of which frequencies should be authorized for SS emissions. In the Petition, the ARRL proposes that brief test transmissions of SS emissions be permitted only on those frequency bands in which SS emissions currently are authorized. TAPR believes that SS emissions should be allowed on all frequency bands covered by the SS STA currently held by Mr. Robert Buaas K6KGS (6m and 2m, in addition to the frequency bands currently authorized by Part 97). In addition, the Commission should allow SS emissions in the 219-210 MHz band, which was authorized for use by the amateur radio service after the Buaas SS STA was originally granted in 1992. Finally, the Commission should not impose any restriction on the length of time SS emissions are transmitted. Ample time already has been provided for the experimental phase of SS usage in the amateur service (five years of experimentation under the 1980 AMRAD STA and ten years under the current Part 97 rules), and it is now time to allow SS use without restriction.

TAPR also differs with the ARRL as to how station identification and documentation should be handled under a revised set of rules. The ARRL in its petition did not ask the Commission to delete sections 97.311(e) and 97.119(b)(5) of the rules, even though it questioned the practicality of the requirements set forth in these sections. TAPR, in contrast, recommends that the Commission delete these subsections of the rules. The interference and harm to the band in which an SS station is operating that would be caused by a requirement to use a CW identification outweighs the benefits that would accrue for monitoring purposes from the use of the ID.

As a result, the amateur radio community should be permitted to develop an

approach for handling the necessary functions of monitoring and identification. TAPR already is working on possible resolutions to this problem and in the near future will be in a position to make a proposal to the Commission on this matter.

#### CONCLUSION

SS technology can provide many useful benefits to the amateur radio community if its use becomes more widespread and mainstream. In order to accomplish this, however, certain changes must be made to the Commission's rules governing the use of SS in the amateur radio service. By making these changes, the Commission will create a regulatory environment that will give members of the amateur radio service enough flexibility to develop innovative equipment and hardware employing SS technology.

For these reasons, TAPR urges the Commission promptly to issue a notice of proposed rule making to facilitate spread spectrum communications in the amateur radio service, as proposed in the Petition and as modified herein.

Respectfully submitted,

THE TUCSON AMATEUR PACKET RADIO CORPORATION

8987-309 E Tanque Verde Rd #337  
Tucson, Arizona 85749-9399  
(817) 383-0000

By: Dewayne Hendricks

February 26, 1996

From wd5ivd@tapr.org Sun Mar 03 00:38:59 1996  
Received: (from wd5ivd@localhost) by tapr.org (8.7.4/8.7.3/1.8) id AAA14308; Sun, 3 Mar 1996 00:38:52 -0600 (CST)  
From: Greg Jones <wd5ivd@tapr.org>  
Message-Id: <199603030638.AAA14308@tapr.org>  
Subject: PSR Deadline March 5th  
To: tapr-bb@tapr.org (TAPR-BB mailing), tapr-board@tapr.org (TAPR Board),  
tapr-sys@tapr.org (TAPR SYS), bstrick@tenet.edu (Bob Stricklin N5BRG),  
karn@servo.qualcomm.com (Phil Karn),  
bstraup@crystal.cirrus.com (Brian Straup), tomm@tapr.org,  
paul.newland@att.com (Paul Newland),  
bdale@chunks.gag.com (Bdale Garbee), n7hpr@tapr.org (Steven Bible),  
n5ahd@unix1.cba.taiu.edu (Robert Diersing),  
llucas@tenet.edu (Larry Lucas),  
hammond@camel.campbell.edu (Mark L. Hammond),  
bbattles@arrl.org (Battles Brian), k3mc@wireless.com (Chiponeous Mike),  
dewayne@warpspeed.com (Dewayne Hendricks), rdw@crl.com (Roy Welch),  
strohs@halcyon.com (Steve Stroh),  
dewayne@warpspeed.com (Dewayne Hendricks)

Date: Sun, 3 Mar 1996 00:38:52 -0600 (CST)  
X-Mailer: ELM [version 2.4 PL25]  
Content-Type: text

PSR Deadline.

This is a reminder that the next PSR Deadline is March 15th.

If you have materials for the PSR, please e-mail them to [psr@tapr.org](mailto:psr@tapr.org) or send them to Bob Hansen, PO Box 1902, Elmira, NY 14902-1902

From [wd5ivd@tapr.org](mailto:wd5ivd@tapr.org) Mon Mar 04 15:12:31 1996  
Received: (from [wd5ivd@localhost](mailto:wd5ivd@localhost)) by [tapr.org](mailto:tapr.org) (8.7.4/8.7.3/1.8) id PAA19426; Mon, 4 Mar 1996 15:12:30 -0600 (CST)  
From: Greg Jones <[wd5ivd@tapr.org](mailto:wd5ivd@tapr.org)>  
Message-Id: <199603042112.PAA19426@tapr.org>  
Subject: 1996 ARRL and TAPR Digital Communications Conference  
To: [tapr-bb@tapr.org](mailto:tapr-bb@tapr.org) (TAPR-BB mailing)  
Date: Mon, 4 Mar 1996 15:12:30 -0600 (CST)  
X-Mailer: ELM [version 2.4 PL25]  
Content-Type: text

Press Release. Please distribute as widely as possible. <http://www.tapr.org>  
March 1st, 1996

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1996 ARRL and TAPR Digital Communications Conference  
September 20-22, 1996  
Seattle, Washington (minutes from SeaTac airport)

Web: <http://www.tapr.org>

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It's that time again! Time to make your travel plans and put the finishing touches on your work for the upcoming 15th Annual ARRL and TAPR Digital Communications Conference.

The ARRL and TAPR Digital Communications Conference is an international forum for radio amateurs in digital communications, networking, and related technologies to meet, publish their work, and present new ideas and techniques for discussion. Presenters and attendees will have the opportunity to exchange ideas and learn about recent hardware and software advances, theories, experimental results, and practical applications. The Digital Communications Conference is not just for the digital expert, but for digitally-orientated amateurs of all levels of experience.

The 1996 ARRL and TAPR Digital Communications Conference will be held on September 20-22, 1996 in Seattle, Washington. This year's conference location is just minutes away from the SeaTac (Seattle/Tacoma) Airport.

Not only is the Digital Communications Conference technically stimulating, it is a weekend of fun for all who have more than a casual interest in any of the ham digital communications modes. This includes BBS operators, networkers, DX-Cluster Sysops, software writers, modem designers, and digital satellite communications enthusiasts. The ARRL and TAPR Digital Communications Conference is for all levels of digital operators -- a must conference to attend to get active on a national level. Now, more than ever, amateur radio needs this great meeting of the minds, since it is important that we demonstrate a continued need for the frequency allocations we now have by pushing forward and documenting our achievements. The ARRL and TAPR Digital Communications Conference is one of the few ways to record our accomplishments and challenge each other to do more.

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#### A Conference for the Beginner as well

The conference is not just for the digital expert. This year's conference will again provide an entire morning with beginning and intermediate presentations on selected topics in digital communications. Some of the topics will include: APRS, Satellite Communications, TCP/IP, Digital Radio, Spread Spectrum and other introductory topics. Come to the conference and hear these topics presented by the experts! Don't miss this opportunity to listen and talk to others in this area.

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#### Workshops

In addition to the presentation of papers on Friday and Saturday, three workshops will be held during the conference. On Friday, Keith Sproul, WU2Z, will hold a workshop on APRS packet-location software. Keith is the Chair of the TAPR APRS Special Interest Group, developer of the Macintosh and more recent co-developer of the Windows95 version of APRS, and a leader in the area of APRS technology. This is a unique opportunity to gain insight into this fast growing new digital aspect of amateur operations that combines computers, packet radio, and GPS (Global Positioning Satellites). On Sunday, Dewayne Hendricks, WA8DZP, will conduct a workshop focusing on "How to utilize Part 15 wireless Radios for Ham Applications." Dewayne is an expert in the area of commercial wireless systems; his company WarpSpeed Imagineering, focuses on wireless Internet connectivity. This workshop presents an opportunity to learn how Personal Communications Technology (handheld and small business wireless systems) can be used in the amateur service. A second Sunday workshop will focus on Wireless Networking using the WA4DSY 56K RF modem Technology. This workshop will focus on the technology and accessories of creating and maintaining 56K networks using the WA4DSY modem and equipment compatible with it such as routers, digital driver cards, transverters, and repeaters. Use of WA4DSY 56K equipment in the 219-220 band will also be discussed.

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#### 1st Annual ARRL and TAPR DCC Student Papers Award

ARRL and TAPR especially welcome papers from full time students to compete for the first annual student papers award. Two \$500 travel awards will be given, one in each of the following categories: a) best technical/theory-oriented paper by a student, and b) best educational or community-oriented application paper by a student. The paper should relate directly to a wireless digital communication topic (see guidelines for more information). Papers coauthored by educators or telecommunications professionals are also eligible for this award, as long as a student is the first author. First year awards have been funded through a grant by The ARRL Foundation, Inc. Deadline for receipt of finished student paper manuscript: June 11, 1996. Please note that this deadline is different than the general conference submission date. For full details and paper guidelines contact TAPR or check <http://www.tapr.org>.

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#### Call for Papers

Anyone interested in digital communications is invited to submit a paper for publication in the Conference Proceedings. Presentation at the Conference is not required for publication. If you know of someone who is doing great things with digital communications, be sure to personally tell them about this! Papers are due by July 23, 1996, and should be submitted to Maty Weinberg, ARRL, 225 Main Street, Newington, CT 06111 or via the Internet to [lweinberg@arrl.org](mailto:lweinberg@arrl.org). Information on paper submission guidelines are available on-line (<http://www.tapr.org>).

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#### Local Co-Hosts

The 1996 ARRL and TAPR Digital Communications Conference is co-hosted by the Puget Sound Amateur Radio TCP/IP Group and Boeing Employees Amateur Radio Society (BEARS).

The Puget Sound Amateur Radio TCP/IP group is an informal group involved in an ongoing project to build and expand an amateur radio digital network in the greater Puget Sound area of the Pacific Northwest US. The Washington Experimenters TCP/IP Network (WETNET) uses TCP/IP as its primary transport protocol and currently has over 250 users. WETNET is linked to other amateur radio TCP/IP networks via the Internet. The Boeing Employees Amateur Radio Society (BEARS) is a general interest amateur radio club for employees of the Boeing Company, headquartered in Seattle, Washington. The BEARS are an active amateur club, supporting radio classes, VHF/UHF repeaters, and digital communications. BEARS has been instrumental in the construction of the Evergreen Intertie, an extensive network of interconnected repeaters in the Pacific Northwest.

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What can you expect during the 1996 ARRL and TAPR Digital Communications Conference ?

- \* A full day of papers and breakouts on Saturday for the beginner to the advanced amateur digital enthusiast.
- \* Three workshops
  - Friday (4pm) - APRS, Conducted by Keith Sproul, WU2Z
  - Sunday (8am) - How to utilize Part 15 Radios for Ham Applications,  
Conducted by Dewayne Hendricks, WA8DZP
  - Sunday (noon) - Wireless Networking using the WA4DSY 56K RF modem Technology
- \* The first annual Student paper session.
- \* A banquet with Special Guest Speaker Lyle Johnson, WA7GXD  
Lyle was one of the founders of TAPR and instrumental in forming many of the current aspects of Amateur Digital Communications. He is currently very active in building several digital aspects of the upcoming Phase 3D satellite.
- \* SIGs (Special Interest Groups) on Saturday following the banquet.
- \* Informal get-togethers throughout the weekend.
- \* A meeting facility that is perfect for this type of meeting.
- \* Vendor area and informal engineering discussions/demonstrations.
- \* An event at which the most important new developments in amateur digital communications are announced.
- \* Digital 'movers and shakers' from all over the world in attendance.
- \* Plenty of Washington State hospitality!

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## Conclusion

If you have attended a Digital Communications Conference in the past, just remember back to how much fun it was discussing the latest developments into the wee hours! If you have never been, then make your plans now to attend and find out how much fun the Digital Communications Conference can be.

There are few activities where the importance of your participation can be so much fun and important! What a great way to share and renew your enthusiasm for digital amateur radio! Getting together with colleagues from all over the world and bringing each other up to date on your latest work. All this, and more, for an unforgettable weekend of ham radio and digital communications. Make your travel and lodging arrangements now. We hope to see you at the ARRL and TAPR Digital Communications Conference on September 20-22!

Full information on the conference and hotel information can be obtained by contacting Tucson Amateur Packet Radio, 8987-309 E. Tanque Verde Road #337,



Tucson, AZ 85749-9399. Phone: (817) 383-0000. Fax: (817) 566-2544. Internet: tapr@tapr.org Web: www.tapr.org

Sincerely,

Steve Ford, WB8IMY, ARRL Conference Co-Chair  
Keith Justice, KF7TP, TAPR Conference Co-Chair  
Steve Stroh, N8GNJ, Local Host Liaison  
Greg Jones, WD5IVD, President TAPR

Note: If you need handouts or flyers for meetings, contact TAPR about getting what you need!

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#### Hotel Information

Conference presentations, meetings, and workshops will be held at the Quality Inn Seattle Airport, a complex co-located with the Radisson Hotel Seattle Airport. Rooms rates are \$66/single-double and \$76/triple. When making reservations with the hotel, be sure to indicate you are attending the ARRL and TAPR DCC conference. It is highly recommended that you book your room prior to arriving - a block of 75 rooms is reserved until September 6th, 1996. After the 75 rooms are booked, rooms will only be available in the Radisson hotel, but will be at a higher price. Be sure to book your rooms early! The hotel provides transportation to and from SeaTac Airport. You should contact the hotel to arrange airport transportation.

Quality Inn Seattle Airport (conference hotel)  
17101 Pacific Highway South, Seattle, WA, 98188  
(206) 246-7000, Fax (206) 246-1715

Radisson Hotel Seattle Airport (alternate hotel)  
17101 Pacific Highway South, Seattle, WA, 98188  
(206) 244-6000, Fax (206) 246-6835

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#### Registration

Contact the TAPR office by Phone, Fax, or e-mail (Internet: tapr@tapr.org) to preregister or for additional meeting information. MasterCard and VISA accepted.

- Preregistration (before Sept 1st) \$40.00 \*

- Late Registration or at door \$45.00 \*

\* - Conference Registration includes:

Conference Proceedings, Sessions, Meetings, and Lunch.

- Saturday Evening Dinner (Limited Space) \$19.00 \*\*

\*\* - Dinner, Speaker: Lyle Johnson, WA7GXD, Prize Drawing

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## Workshops

### APRS Workshop

Friday, 4pm - 7pm. Conducted by Keith Sproul, WU2Z

- Registration \$15.00

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How to utilize Part 15 Radios for Ham Applications Workshop, Sunday, 8:00am

- 11:00am. Dewayne Hendricks, WA8DZP

- Registration \$15.00

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Wireless Networking using the WA4DSY 56K RF modem Technology Workshop

Sunday, 12noon - 3pm.

- Registration \$15.00

Contact TAPR to register for the DCC.

Tucson Amateur Packet Radio, 8987-309 E. Tanque Verde Road #337, Tucson, AZ 85749-9399. Phone: (817) 383-0000. Fax: (817) 566-2544.

Internet: [tapr@tapr.org](mailto:tapr@tapr.org) <http://www.tapr.org>

From [wd5ivd@tapr.org](mailto:wd5ivd@tapr.org) Fri Mar 08 18:15:57 1996

Received: (from [wd5ivd@localhost](mailto:wd5ivd@localhost)) by [tapr.org](mailto:tapr.org) (8.7.5/8.7.3/1.8) id SAA06617; Fri, 8 Mar 1996 18:15:56 -0600 (CST)

From: Greg Jones <[wd5ivd@tapr.org](mailto:wd5ivd@tapr.org)>

Message-Id: <199603090015.SAA06617@tapr.org>

Subject: TAPR at Dayton

To: [tapr-bb@tapr.org](mailto:tapr-bb@tapr.org) (TAPR-BB mailing)

Date: Fri, 8 Mar 1996 18:15:56 -0600 (CST)

Cc: [0003241437@mcimail.com](mailto:0003241437@mcimail.com) (Bill Pasternak),

[lenwink@indirect.com](mailto:lenwink@indirect.com) (Len Winkler),

[mbohnhof@pop.wwwa.com](mailto:mbohnhof@pop.wwwa.com) (Mark T. Bohnhoff),

[tapr-board@tapr.org](mailto:tapr-board@tapr.org) (TAPR Board), [wo5h@tapr.org](mailto:wo5h@tapr.org) (Dave Wolf TCET),

[jra@ag9v.ampr.org](mailto:jra@ag9v.ampr.org) (John Ackermann)

X-Mailer: ELM [version 2.4 PL25]

Content-Type: text

TAPR Dayton Activities '96

TAPR again will be very active at this year's Hamvention. With the joining of the TAPR spring meeting with the ARRL Digital Communications Conference, TAPR Dayton activities now make up TAPR's Spring gathering. If you are

attending Dayton, please take a gander at the following schedule. We have tried to improve upon last year and we believe we have. Come join us at the Digital Forum on Friday and then come have Dinner and a good time that evening at the PacketBASH.

Our booth will be in its usual place and activity around the booth is expected to be high, with the APRS SIG and the Sproul brothers showing the latest in Windows and MAC APRS at one end of the booth. It is rumored that there will be a APRS CD-ROM made available at that time. So -- if you are an APRS enthusiast, plan to stop by.

The dates for this year's Dayton Hamvention is May 17-19, 1996.

#### TAPR Schedule

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##### Friday

12noon -- Exhibit Area Opens  
1:00pm -- TAPR Digital Forum Begins  
7:00pm -- PacketBASH  
(Dinner, Prizes, SIG meetings, Banquet Speaker!)

##### Saturday

8am -- Exhibit Area Opens  
6pm -- Exhibit Area Closes  
9pm -- Informal SIG Meeting (TBD)

##### Sunday

8am -- Exhibit Area Opens  
2pm -- Exhibit Area Closes

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#### 1996 TAPR Digital Forum (Friday)

The TAPR digital forum should be a great forum this year. If you have time at Dayton -- be sure to attend the meeting!

1:00 - 1:45pm

- \* Introduction to Digital Communications  
Greg Jones, WD5IVD

1:45 - 2:30pm

- \* Making 56K Operations a Reality!  
Barry McLarnon, VE3JF

2:30 - 3:15pm

- \* Spread Spectrum Technology and current issues in Amateur Radio  
Phil Karn, KA9Q

3:15 - 3:45pm

- \* DAS and PCON and there use in Emergency Communications  
Paul Newland, AD7I

3:45 - 4:15pm

- \* BBS Issues and Trends  
Barry Buelow, WA0RJT

4:15 - 5:00pm+

- \* APRS Update and SIG Meeting  
Bob Bruninga, WB4APR and Keith Sproul, WU2Z

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## 1996 Packet Bash!

The 1996 "Packet BASH" sponsored by TAPR and the Miami Valley FM Association will be held on Friday of the Dayton Hamvention. The BASH will be moved this year to a very much larger site! So, if you were one of the folks that felt it was just too crowded for dinner -- you were not alone. The reason for the move was that TJ's Restaurant was just a little small for 1995. The event will be held at the AT&T site in Oakwood, OH (formerly NCR). The event will be catered and the dinning room holds about 400 people! So the more the merrier! Dinner space will be limited, so make your reservation early for dinner, so that the correct number of dinners can be ordered in advanced. To make the event even better -- we can stay a lot later than at the TJ's site last year, so we should have time for informal discussions after dinner.

- \* A buffet dinner,
- \* a raffle for some neat prizes,
- \* a great program,
- \* and lots of fun will cost approximately \$20 per person.

We hope that this will provide an opportunity for packet and digital radio enthusiasts to have a great night out while at Hamvention.

The schedule of events for the PacketBASH is still tentative, but will look something like this:

- 1900 -- Dinner
- 1945 -- Welcome
- 2000 -- Keynote Address
- 2030 -- Raffle
- 2045 -- TAPR SIG Meetings

Talkin will be on 146.415 simplex.

For more information, send email to "packbash@ag9v.ampr.org" or stop by the TAPR booth at Dayton for schedule and map. The maps are currently available on <http://www.tapr.org> also.

Banquet tickets can be ordered from the TAPR office. Reservations made before May 1st will have there tickets mailed to them. After May 1st, tickets purchased will be available for pickup at the TAPR booth. Walk-up to the event will be accommodated as best as possible. There is limited space (in the way of food ordered) for Dinner. Amateurs who wish to attend the speaker and discussion are asked to arrive around 2000 (8pm).

From wd5ivd@tapr.org Sat Mar 09 20:41:08 1996  
Received: (from wd5ivd@localhost) by tapr.org (8.7.5/8.7.3/1.8) id UAA25427 for tapr-bb@tapr.org; Sat, 9 Mar 1996 20:41:07 -0600 (CST)  
From: Greg Jones <wd5ivd@tapr.org>  
Message-Id: <199603100241.UAA25427@tapr.org>  
Subject: [TAPR-BB:149] NETROM/THE NET (fwd)  
To: tapr-bb@tapr.org (TAPR-BB mailing)  
Date: Sat, 9 Mar 1996 20:41:07 -0600 (CST)  
X-Mailer: ELM [version 2.4 PL25]  
Content-Type: text

Sender: dmedley@ix.netcom.com (David Medley)  
Subject: NETROM/THE NET

I am trying to help a TAPR customer set up a node for a BBS. I need the HEX code and editor for either NETROM or THE NET. Could somebody please tell me where I can find this info. It must be on the WWW somewhere.

Thanks

Dave KI6QE

From wd5ivd@tapr.org Sat Mar 09 23:35:25 1996  
Received: (from wd5ivd@localhost) by tapr.org (8.7.5/8.7.3/1.8) id XAA06009 for tapr-bb@tapr.org; Sat, 9 Mar 1996 23:35:24 -0600 (CST)  
From: Greg Jones <wd5ivd@tapr.org>  
Message-Id: <199603100535.XAA06009@tapr.org>  
Subject: [TAPR-BB:152] RM-8737 Comments Posted to WWW.TAPR.ORG (fwd)  
To: tapr-bb@tapr.org (TAPR-BB mailing)  
Date: Sat, 9 Mar 1996 23:35:24 -0600 (CST)  
X-Mailer: ELM [version 2.4 PL25]  
Content-Type: text

Sender: "Steven R. Bible" <srbibble@mindport.net>  
Subject: RM-8737 Comments Posted to WWW.TAPR.ORG

Comments to RM-8737, Ammendment of Part 97 of the Commission's Rules  
Governing the Amateur Radio Service to Facilitate Spread Spectrum  
Communications are being posted to

<http://www.tapr.org/ss>

The following comments are presently posted:

Southern California Repeater and Remote Base Association (SCRRBA), 2/23/96  
TAPR Comments 2/26/96  
Robert A. Buaas, K6KGS 2/26/96  
National Communications System, 2/26/96  
The Indiana Repeater Council, 2/28/96  
Henry Ruh, KB9FO, Publisher, Amateur Television Quarterly, 2/28/96  
Charles M. Albert, Jr. KC6UFM, 3/4/96

Mike Cheponis, K3MC 3/4/96

Comments from the following will be posted as time permits:

Nels Harvey, WA9JOB, 2/20/96  
Witt Brown, WB0CJX, Frequency Coordination Chairman  
of the Mid-America Coordination Council, Inc., 2/26/96  
George Isely, WD9GIG, President  
of the Mid-America Coordination Council, Inc., 2/26/96  
The San Bernardino Microwave Society, 2/20/96  
SouthEastern Repeater Association, Inc., 2/23/96  
John Mock, KD6PAG, 2/27/96

From wd5ivd@tapr.org Tue Mar 12 20:07:23 1996  
Received: (from wd5ivd@localhost) by tapr.org (8.7.5/8.7.3/1.8) id UAA00168; Tue,  
12 Mar 1996 20:07:22 -0600 (CST)  
From: Greg Jones <wd5ivd@tapr.org>  
Message-Id: <199603130207.UAA00168@tapr.org>  
Subject: TAPR Reply Comments on RM-8737  
To: tapr-bb@tapr.org (TAPR-BB mailing)  
Date: Tue, 12 Mar 1996 20:07:21 -0600 (CST)  
Cc: ss@tapr.org  
X-Mailer: ELM [version 2.4 PL25]  
Content-Type: text

Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, D.C. 20554

In the Matter of	)	
	)	
Amendment of Part 97 of the	)	RM-8737
Commissions Rules Governing	)	
the Amateur Radio Service to	)	
Facilitate Spread Spectrum	)	
Communications	)	

To: The Commission

REPLY COMMENTS OF TUCSON AMATEUR PACKET RADIO CORPORATION

The Tucson Amateur Packet Radio Corporation ("TAPR") submits the following reply comments regarding the Petition for Rulemaking (the "Petition") filed by the American Radio Relay League ("ARRL"), which proposed certain changes in the rules governing spread spectrum operation in the Amateur Radio Service ("ARS").

## I. PERMITTING MORE WIDESPREAD SPREAD SPECTRUM OPERATION IN THE ARS WOULD SERVE THE PUBLIC INTEREST.

A number of the comments recognized the benefits that could be provided by more widespread use of spread spectrum technologies in the ARS (1). In addition to those that would accrue to ARS operators, as described in the Petition, increased use of spread spectrum in the ARS would contribute to the overall development of spread spectrum communications (2) and, as a result, would provide benefits indirectly to commercial users as well.

Expanded use of spread spectrum in the ARS also would further the Commission's objective of promoting efficient spectrum use. At the FCC's March 5, 1996 en banc hearing on spectrum policy, Paul Barends, the "father" of one of the technologies that forms the basis of the Internet, made the following statement:

"What do we see today if we tune a spectrum analyzer or a radio receiver across most of the scarce spectrum bands? Mostly nothing. Dead air. This strongly suggests that most of our limited spectrum space is not being fully utilized and is going to waste. Specifically, with digital technology, spectrum bands can be more efficiently packed without interfering with existing services."

By increasing the ability of ARS operators to use spread spectrum technologies, the Commission would enhance their ability to use digital technologies to enhance spectrum efficiency, as recommended in the above passage. In turn, the Commission also would make it possible for the ARS better to accommodate the many new users seeking to use ARS bands, which are already congested due to the widespread use of non-digital equipment.

Although spread spectrum is not a panacea, it offers the promise of increased spectrum efficiency, reduced interference, and improved communication performance without adversely affecting other spectrum users. As a result, the Commission's rules governing spread spectrum operation should be modified to enable these technologies to flourish within the amateur service community.

## II. EXPANDED SPREAD SPECTRUM OPERATIONS WILL NOT ADVERSELY AFFECT OTHER ARS OPERATIONS.

Several repeater coordinating organizations, who are responsible for the coordination of repeater operations in their regional areas of activity, filed comments opposing to the Petition. These entities generally alleged that adoption of ARRL's proposals would cause widespread interference to, and disruption of, existing operations.

The fears and concerns expressed in these comments defy the proven ability of properly designed and implemented spread spectrum systems to operate in harmony with other spectrum users, are based upon "worst-case" scenarios, and reflect a desire to maintain the status quo even at the cost of stifling new technologies and services. As a result, they should not be permitted to prevent the development of spread spectrum in the ARS.

First, as discussed by Robert Buaas, claims that spread spectrum operation will raise the noise floor ignore the fact that few real systems operate near the noise floor, and those that do would profit from applying spread spectrum technology (3).

Second, in the ten years since the Commission first allowed limited spread spectrum operation in the ARS, a great deal of work has been done to address concerns that more flexible spread spectrum operation would adversely affect other types of ARS operations. In particular, the 1991 Buaas spread spectrum STA has made it possible for experimenters to engage in widespread use of spread spectrum technologies in the amateur band allocations below 450 MHz. Notably, operation under the existing spread spectrum rules and experimentation under the spread spectrum STA have not generated substantiated claims of objectionable interference (4).

Finally, the successful operation of Part 15 spread spectrum systems provide substantial evidence of the ability of these devices to co-exist with other users. Today, millions of spread spectrum devices operating under Section 15.247 of the Commission's rules are being used to support end-user solutions in areas such as cordless phones, location monitoring devices, and local and metropolitan-area networking. These devices have been deployed across the United States without any local coordination and without any licensing by the Commission. Yet despite this flexibility and extensive use, spread spectrum Part 15 devices have almost universally operated without causing objectionable interference to other Part 15 devices or to others operating in shared spectrum (5). This success story provides ample proof that when spread spectrum devices are properly designed, manufactured, and deployed, they can coexist successfully with many diverse applications and, in addition, can facilitate frequency reuse.

In light of this history of successful, non-interfering operation, the Commission should not permit unsubstantiated claims of potential interference to thwart the introduction and use of new spread spectrum technologies in the ARS (6).

### III. SECTION 97.119(B)(5) OF THE RULES SHOULD BE DELETED, AS SUGGESTED BY NCS.

TAPR supports the suggestion made by the Manager of the National Communications System ("NCS") to delete Part 97.119 (b)(5), which deals with the requirement for CW identification. TAPR agrees that no currently available commercial equipment implements such a function, and that deletion of this requirement will act to speed the rapid adoption of this equipment into use in the ARS.

### CONCLUSION

TAPR congratulates the ARRL for its forward-looking proposal to liberalize the spread spectrum rules in the ARS. ARRL's proposal, if adopted, could provide a variety of benefits to both members of the amateur service



community and to the wider public.

Proposals to modify the status quo often generate opposition by those who are adequately served by it. Like the turmoil that occurred in the ARS during the transition from AM to SSB, the growing use of spread spectrum in the service will not be without incidents of disagreement and misunderstanding. For this reason, TAPR intends to use its resources during the rulemaking process to educate the ARS community on the theory, application, and practice of spread spectrum technology.

Yet while fear and opposition are understandable, they should not be permitted to stifle new developments. In light of spread spectrum's strong track record and proven benefits, unsubstantiated claims of potential interference should be discounted and the Commission should act promptly to issue a Notice of Proposed Rulemaking proposing to implement the changes sought by ARRL, modified as discussed in TAPR's earlier comments.

Respectfully submitted,

THE TUCSON AMATEUR PACKET RADIO  
CORPORATION

By:

Dewayne Hendricks  
Tucson Amateur Packet Radio Corporation  
8987-309 E Tanque Verde Rd #337  
Tucson, Arizona 85749-9399  
(817) 383-0000

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(1) See, e.g., Comments of Robert A. Buaas (RBuaas CommentsS); Comments of the Manager of the National Communications System (RNCS CommentsS); Comments of John Mock; Comments of Henry B. Ruh; see also ARRL Petition.

(2) See NCS Comments at p. 3.

(3) Buaas Comments at p. 2.

(4) Buaas Comments at p. 3.

(5) See Comments of the Part 15 Coalition, PR Docket No. 93-61 (1995).

(6) TAPR believes that a program of continuing education to the ARS community on the merits and benefits of spread spectrum technology coupled with a wider use and deployment of equipment by amateurs in various applications will go a long way towards resolving the concerns of many of the commenters who have filed in opposition. TAPR intends to use its resources to perform this function and service for the amateur radio

community in much the same fashion that it helped start the packet radio revolution in the ARS during the mid-1980Us.

From wd5ivd@tapr.org Thu Mar 14 02:12:00 1996  
Received: (from wd5ivd@localhost) by tapr.org (8.7.5/8.7.3/1.8) id CAA06013; Thu, 14 Mar 1996 02:11:57 -0600 (CST)  
From: Greg Jones <wd5ivd@tapr.org>  
Message-Id: <199603140811.CAA06013@tapr.org>  
Subject: RM-8737 on SS Issues Updated  
To: ss@tapr.org, tapr-bb@tapr.org (TAPR-BB mailing),  
amsat-bb@amsat.org (AMSAT BB Mail Group)  
Date: Thu, 14 Mar 1996 02:11:57 -0600 (CST)  
X-Mailer: ELM [version 2.4 PL25]  
Content-Type: text

The web page on RM-8737 concerning SS Amateur Rule Changes has been updated. Additional comments and reply comments will be added as time allows.

It contains the following as of March 13th, 1996:

The Initial Filing, assigned as RM-8737  
ARRL Petition for Rulemaking, filed December 12th, 1995.

Comments to RM-8737

San Bernardino Microwave Society 2/20/96  
Robert A. Buaas, K6KGS 2/23/96  
Southern California Repeater and Remote Base Association  
(SCRRBA), 2/23/96  
SouthEastern Repeater Association, Inc 2/23/96  
TAPR Comments 2/26/96  
National Communications System, 2/26/96  
George Isely, WD9GIG, President, MACC, 2/26/96  
Whit Brown, WB0CJX, Frequency Coordination Chairman, MACC, 2/26/96  
The Indiana Repeater Council, 2/28/96  
Henry Ruh, KB9FO, Publisher, Amateur Television Quarterly, 2/28/96  
Charles M. Albert, Jr. KC6UFM, 3/4/96  
Mike Cheponis, K3MC 3/4/96

Reply Comments to RM-8737

Mike Cheponis, K3MC 3/6/96  
Bill Tynan, W3XO 3/11/96  
AMSAT 3/11/96  
TAPR 3/11/96  
Phil Karn 3/11/96  
Robert A. Buaas, K6KGS 3/11/96  
Steven Bible, N7HPR 3/11/96  
Naval Postgraduate School 3/11/96  
Charles M. (Marty) Albert, Jr. KC6UFM 3/13/96

To review these, you can check <http://www.tapr.org/ss>

From wd5ivd@tapr.org Mon Mar 18 02:13:06 1996  
Received: (from wd5ivd@localhost) by tapr.org (8.7.5/8.7.3/1.8) id CAA21096 for tapr-bb@tapr.org; Mon, 18 Mar 1996 02:13:05 -0600 (CST)  
From: Greg Jones <wd5ivd@tapr.org>  
Message-Id: <199603180813.CAA21096@tapr.org>  
Subject: Packet Radio: What? Why? How?  
To: tapr-bb@tapr.org (TAPR-BB mailing)  
Date: Mon, 18 Mar 1996 02:13:05 -0600 (CST)  
X-Mailer: ELM [version 2.4 PL25]  
Content-Type: text

TAPR is currently working on making a second printing on the publication "Packet Radio: What? Why? How?"

If you have suggestions regarding the publication before we go to the printers, please send an e-mail to wd5ivd@tapr.org with your comments.

We can make a few changes and want to get input if you have it.

From wd5ivd@tapr.org Tue Mar 26 00:24:22 1996  
Received: (from wd5ivd@localhost) by tapr.org (8.7.5/8.7.3/1.8) id AAA00696; Tue, 26 Mar 1996 00:24:21 -0600 (CST)  
From: Greg Jones <wd5ivd@tapr.org>  
Message-Id: <199603260624.AAA00696@tapr.org>  
Subject: TAPR Virtual Meeting, Workshop, Seminar Page  
To: tapr-bb@tapr.org (TAPR-BB mailing), netsig@tapr.org (NETSIG mailing), bbssig@tapr.org (BBS SIG mailing)  
Date: Tue, 26 Mar 1996 00:24:20 -0600 (CST)  
X-Mailer: ELM [version 2.4 PL25]  
Content-Type: text

TAPR has updated its TAPR Virtual Meeting, Workshop, Seminar Page

We have added an interview with Joe Borvitz, WA5VMS, concerning Land Mobile Radio Modifications.

The interview took place after the Green Country Convention this past week. The 30 min interview with Joe Borvtiz, WA5VMS, focuses on Land Mobile Radio Modifications and issues for amateur radio usage. Joe is one of the two authors of the upcoming TAPR Land Mobile Radio Modifications Book. Joe covers general information on several radios, minimum test equipment needed, prices, and some general thoughts on the subject at hand.

The TAPR book should be available later this year.

<http://www.tapr.org>

From wd5ivd@tapr.org Sun Mar 31 21:22:06 1996  
Received: (from wd5ivd@localhost) by tapr.org (8.7.5/8.7.3/1.9) id VAA14495; Sun, 31 Mar 1996 21:22:03 -0600 (CST)  
From: Greg Jones <wd5ivd@tapr.org>

Message-Id: <199604010322.VAA14495@tapr.org>  
Subject: TAPR GPS Purchase (Announcement)  
To: aprssig@tapr.org (APRS SIG), tapr-bb@tapr.org (TAPR-BB mailing)  
Date: Sun, 31 Mar 1996 21:22:02 +4200 (CST)  
X-Mailer: ELM [version 2.4 PL25]  
Content-Type: text

TAPR offers group GPS purchase 4/1/96  
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TAPR working with Bob Bruninga, WB4APR, will be making a group purchase on Garmin 20 GPS units.

For full details on the purchase as well as information regarding the unit, please see the following web page <http://www.tapr.org/gps>

The price will be:

\$165.00 US for members of TAPR

or

\$175.00 US for non-members

This kit will include:

- \* Garmin GPS-20 (MultiTrac8 sensor) engine (1.83" x 2.74" x .45")  
The Garmin GPS-20 is similar to the Garmin GPS-45
- \* RF pig tail with connector for unit  
(one end is the MCX male connector  
and the other end will be non-connected - see below)
- \* power/data cable with connector shell and pins  
(The connector is a subminiature PCB edge connector  
and will need to be built - see below)
- \* Documentation

TAPR will be taking orders for 50 units, which is the minimum purchase. Once 50 units have been purchased TAPR will order the Garmin units. TAPR will deposit money when the units are ordered from Garmin and ship when the units arrive from Garmin. It is expected that the demand will be high, thus a short period should be required to receive the 50 orders.

Please note: This is not an enclosed/sealed unit. It is assumed that the purchasers will be installing the unit in another enclosure for normal and experimental operations.

No 10% Discount for TAPR Members. Due to the nature of the purchase, the \$165 purchase price for TAPR members represents the membership discount.

If you would like to order one of these units, you can  
e-mail [tapr@tapr.org](mailto:tapr@tapr.org),  
phone (817) 383-0000, or

fax (817) 566-2544.

Office Hours: Tuesday - Friday 9am - 12pm, 3pm - 5pm Central Time

These units will be useful with current APRS software and the upcoming TAC (Totally Accurate Clock) kit that Tom Clark, W3IWI, has begun discussing with TAPR to do as a kit in the future. For more on the TAC project check: <ftp://aleph.gsfc.nasa.gov/GPS/totally.accurate.clock/>

Questions concerning the unit and details on the buy will be handled on the TAPR APRS Special Interest Group list. To subscribe, send e-mail to:

[listserv@tapr.org](mailto:listserv@tapr.org).

In the message type

subscribe aprssig YourFirstName YourLastName.

The server will then send you a message back. Announcements on the status of the shipment will be made to the TAPR APRS SIG and TAPR-BB lists.

### Shipping and Handling

- \* Shipping and Handling within the US will be \$7.00 US by UPS Ground unless otherwise requested by purchaser.
- \* International Shipping will need to contact the TAPR office and get a quote on the shipping to your country. TAPR uses International Express Mail, unless the purchaser requires something else.

### General Information

All Garmin engines come complete with DGPS input capability (see note below), PPS timing output and lithium 3V battery on board.

MultiTrac8: Tracks and uses up to 8 satellites for accurate, reliable GPS data at an incredibly low 1 watt power consumption. Unit has and a real time clock, PPS timing and nonvolatile memory right on the board.

Footprint (1.83" x 2.74" x .45")

Architecture                      Patented MultiTrac8

#### Time to first fix

reacquisition	< 2 sec
warm	20 sec
cold	2 min
sky search	15 min
update rate	1 sec continuous

#### Dynamics

velocity	999 knots
acceleration	3 g
jerk	20 m/s <sup>3</sup>

Datums 102 predefined, 1 user defined

#### Electrical

input voltage 5.0V DC +- 5% regulated  
(a suitable regulator should be used)  
power consumption 0.8 watts  
backup on board 3V lithium (10 year lifetime)  
sensitivity -166 dBW

#### Connector

antenna 50 ohm MCX female connector for active  
(5V DC @ 15ma) or passive antenna  
power/data single row, right angle 12 pin male

#### Physical

configuration 1 integrated board engine  
size 1.83"W X 2.75"L X 0.45"H  
weight 1.1 oz  
op temp -30 deg C - 80 deg C  
(remove Li battery for extended usage above 80 deg C)  
storage temp -40 deg C - 85 deg C

#### Interface

compatibility 2 RS-232 serial ports  
data rate User selectable baud rate  
1200/2400(tx only)/4800/9600  
format NMEA 0183 v.2.0, ASCII  
inputs Initial position, date and time (not required),  
2D/3D & earth datum command,  
RTCM-104 v.2.0 differential  
outputs Position, velocity & time, receiver and  
satellite status, geometry and error estimates  
timing output Timing output with +- 1 microsecond accuracy

#### Frequently Asked Questions

- 
- \* Any altitude limitations?  
The GPS engines will deactivate themselves above 50,000 feet.
  - \* The Garmins only send out final solutions (NMEA sentences).  
There is no other data available from them (including preprocessing data).
  - \* The Multitrak8 has only one channel, but is multiplexed.
  - \* The Multitrak8 can accept DGPS signals (see note below).
  - \* Antenna options (which can be purchased directly from Garmin if required)  
include:
    - mag mount

- flange mount (bolt to a car)
- trunk clip
- suction cup mounted

- \* The unit has true time clocks, PPS timing, and nonvolatile memory on board.
- \* The interface is NMEA 0183 (TTL levels) and RS232 (+ and - 15 volts)
- \* The unit can be powered by AA batteries.  
Batteries or external supplies will require a suitable power regulator.
- \* The unit only gives NMEA sentences as output, no extraction of RTCM-104 data.
- \* There's no problem with the antenna being close to the boards.  
All sensitive components are shielded.
- \* The unit has a LNAs and you can use passive antennas.  
You need to keep the antenna runs short however.
- \* The antenna is attached with a MCX connector, which is a friction lock connector. A male MCX connector with short RF cable is included in the kit purchase.
- \* There's a header for connecting the data cables.  
A connector and cable will be included in the kit (it will need to be soldered). The connector is a subminiature PCB edge connector. This is not the same connector as used with many hand-held units.
- \* You cannot adjust the intervals that the boards outputs data.  
However, you can adjust their baud rate. At 4800 the boards repeat data every 2 seconds. At 9600 baud, data is repeated every 1 second.
- \* The boards do adjust for leap seconds (via the satellites).
- \* For DGPS, since these are just the boards, you can't use the Garmin DGPS receivers. The Garmin units get tuning instructions from the GPS keyboard (which are not on the boards). To receive DGPS signals, you'll need a tunable beacon receiver. Correction signals are sent in through the data in cable (just like the handhelds).

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Tucson Amateur Packet Radio

8987-309 E Tanque Verde Rd #337 \* Tucson, Az \* 85749-9399 \* 817-383-0000

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e-mail: TAPR@TAPR.ORG ftp: ftp.tapr.org web: http://www.tapr.org/tapr